Harford Streams

BARRY GLASSMAN
COUNTY EXECUTIVE

HARFORD COMMUNITY COLLEGE

UNIVERSITY OF MARYLAND EXTENSION
Solutions in your community

WSA
Watershed Stewards Academy

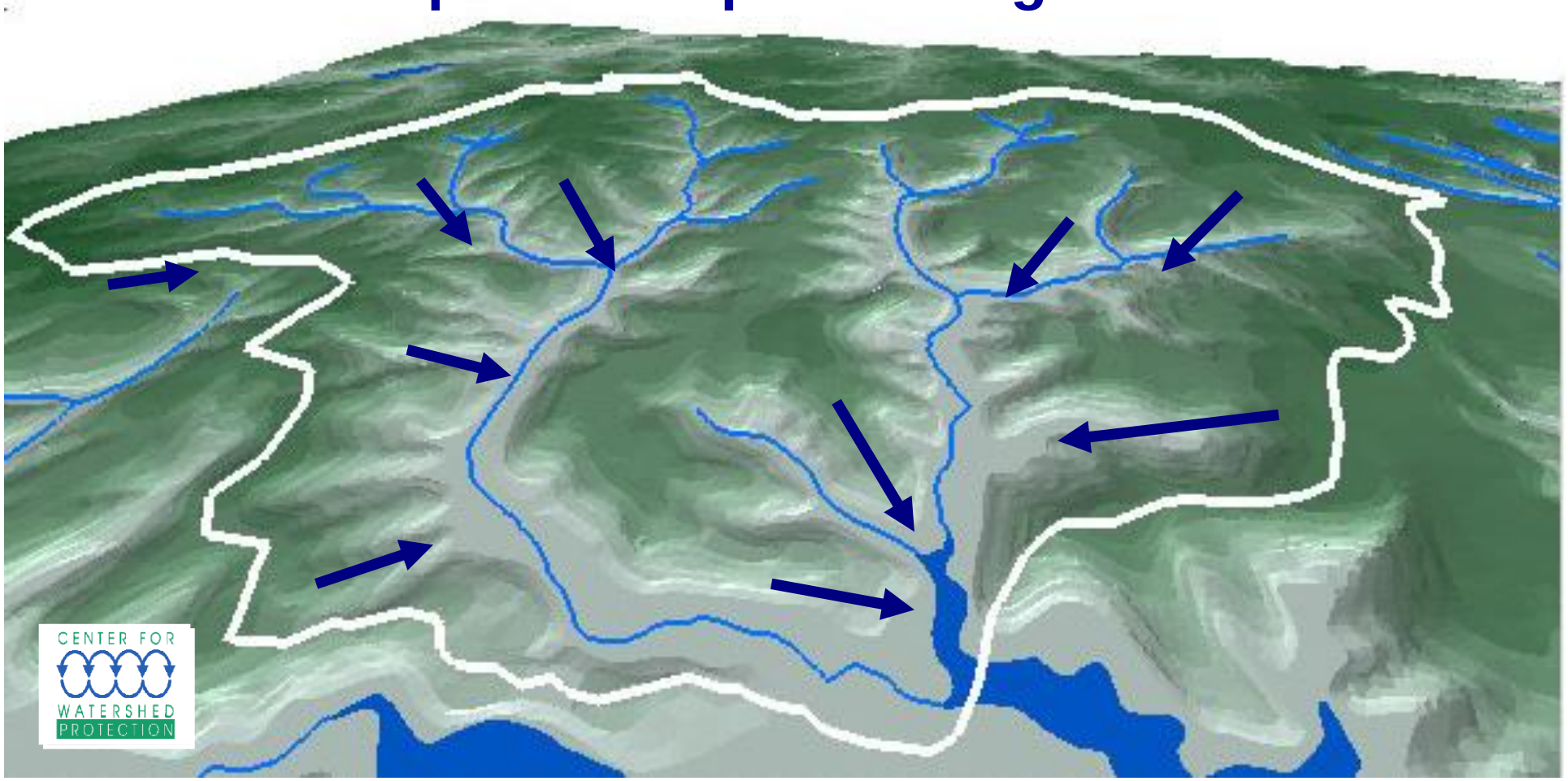
Fishable
Swimmable
Drinkable

It's all about the streams!

- Healthy backyard streams are key to a healthy Chesapeake Bay
- Maryland has 14,000 miles of streams
- Harford County has 2,500 miles of streams
- All streams have two banks, convey water, and transport sediment
- Each stream is unique – reflected by landscape and watershed characteristics

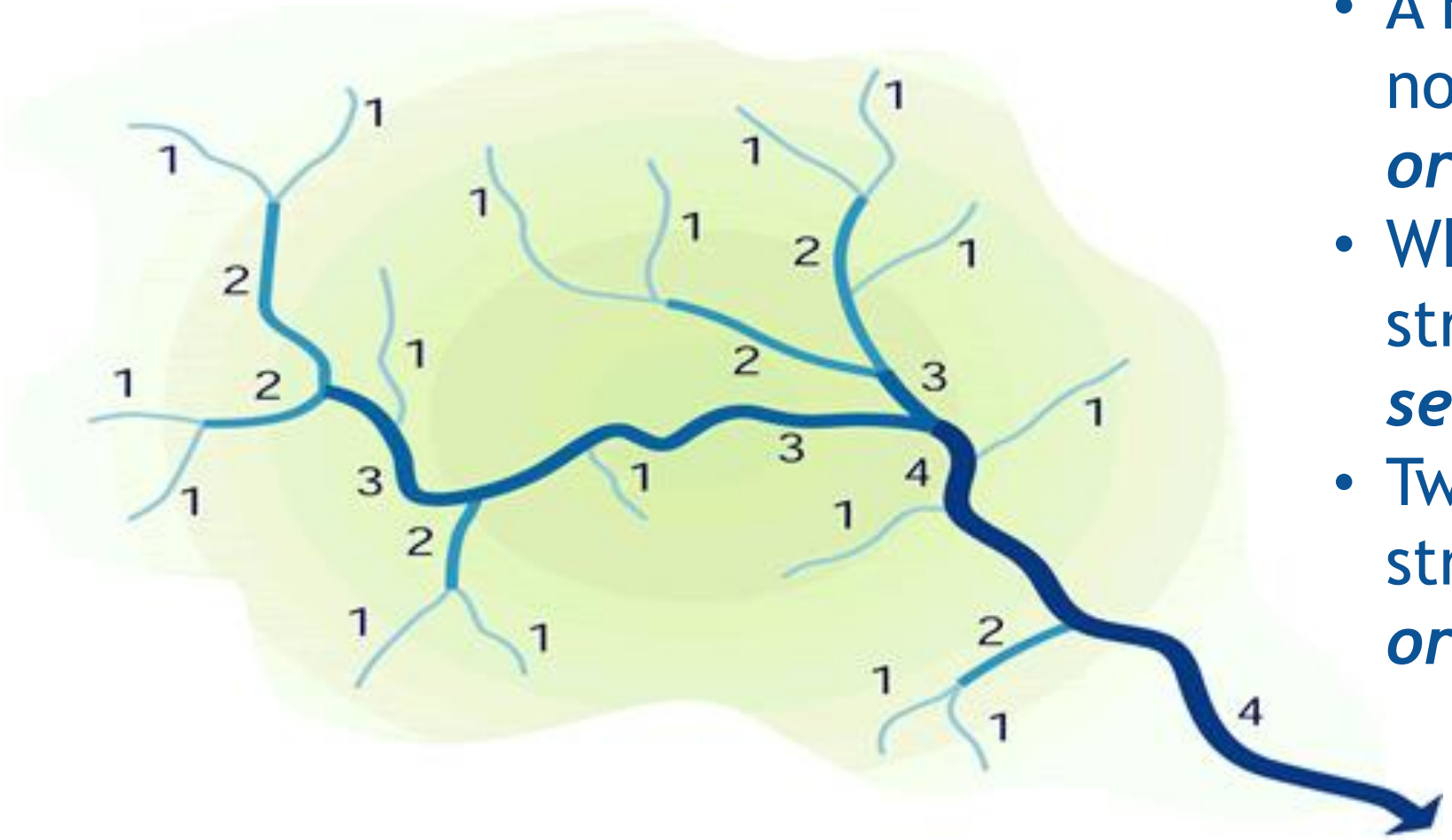
What Is a Watershed?

A watershed is the area of land that drains to a particular point along a stream



Center for Watershed Protection

Stream Order Classification

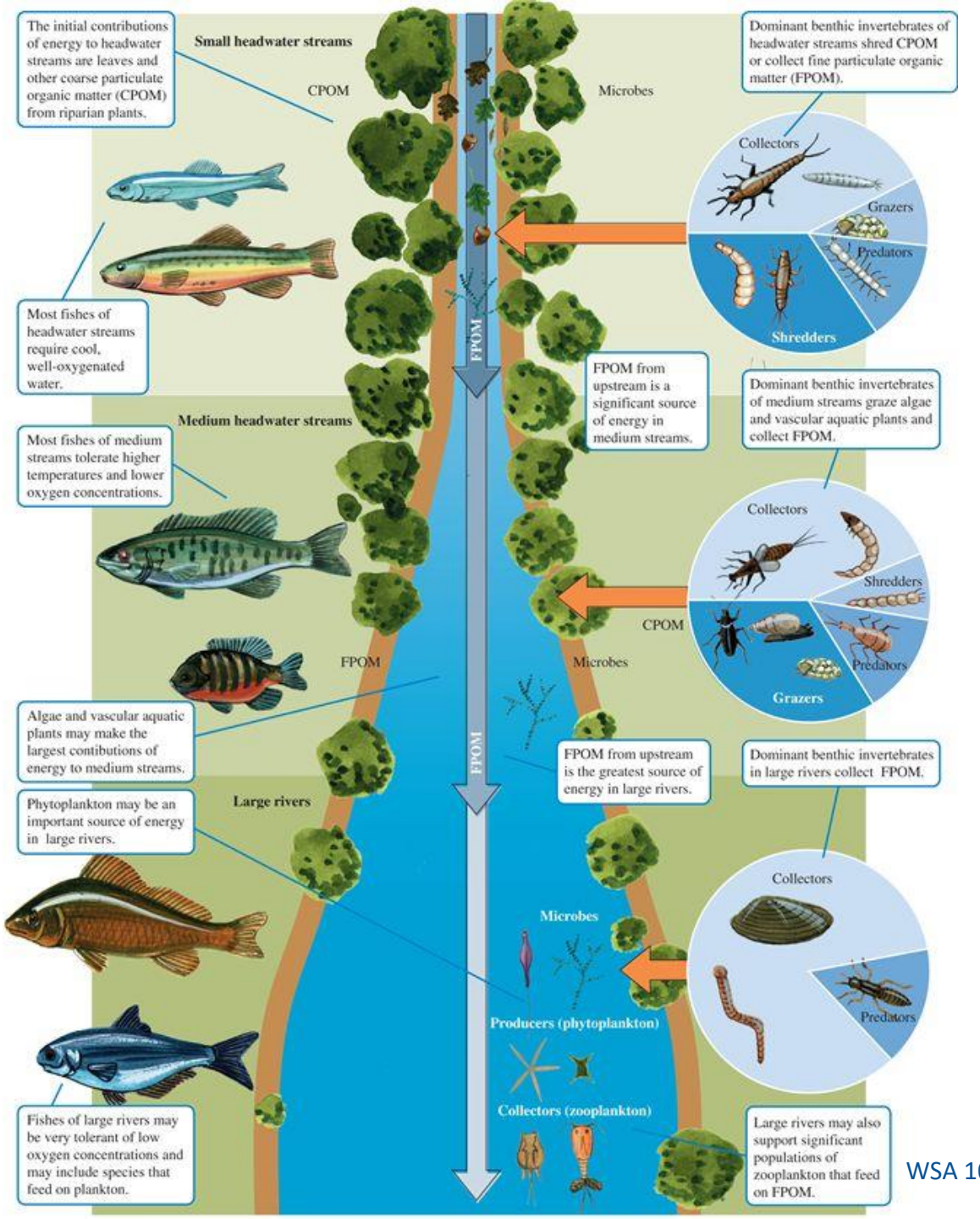


- A headwater stream with no tributaries is a ***first order*** stream
- When two first order streams join, they form a ***second order*** stream
- Two second order streams form a ***third order*** stream, etc.

River Continuum Concept

Connections from upstream to downstream habitats control flow of energy and carbon in fluvial ecosystems, as well as species of aquatic organisms

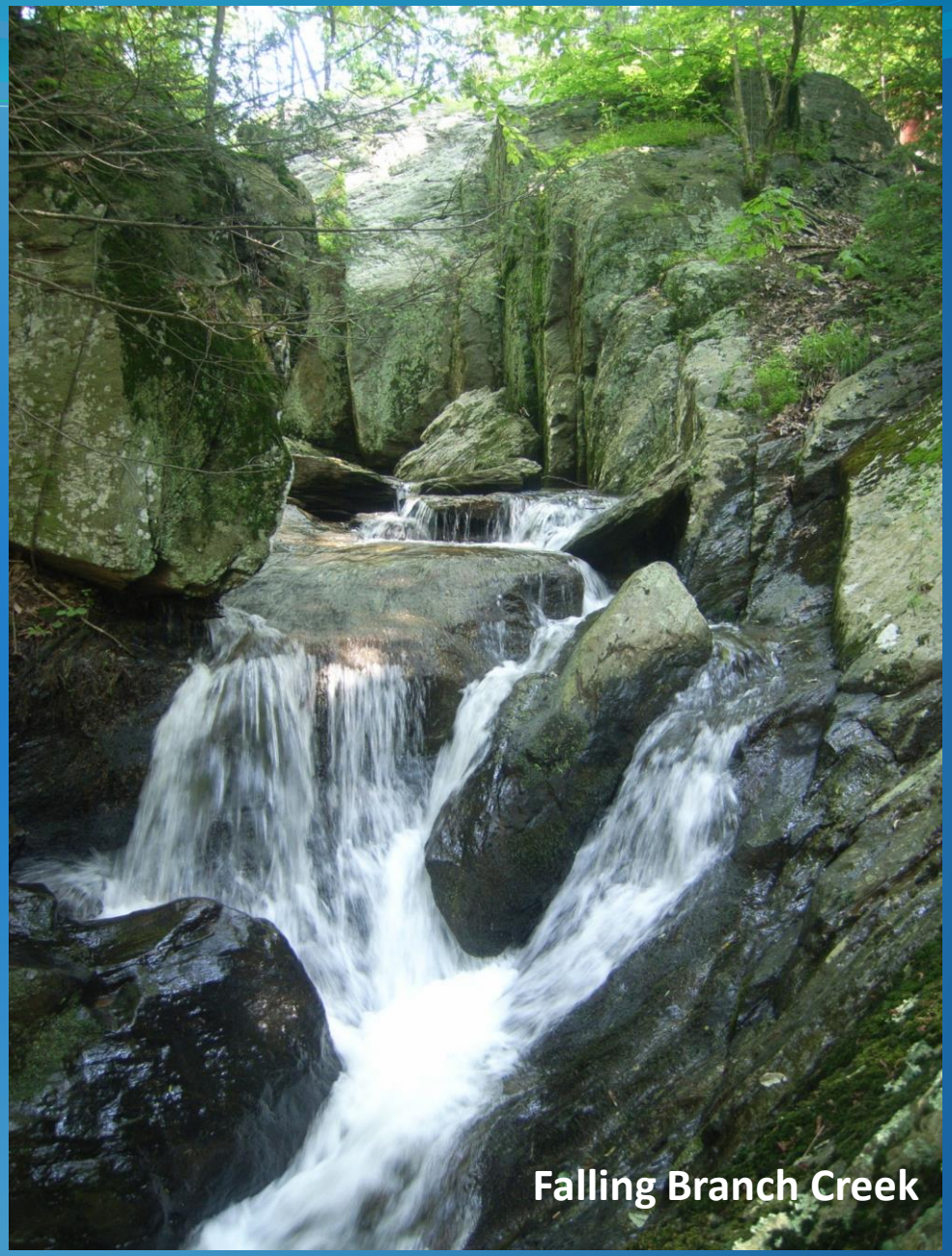
Importance of light availability in controlling production

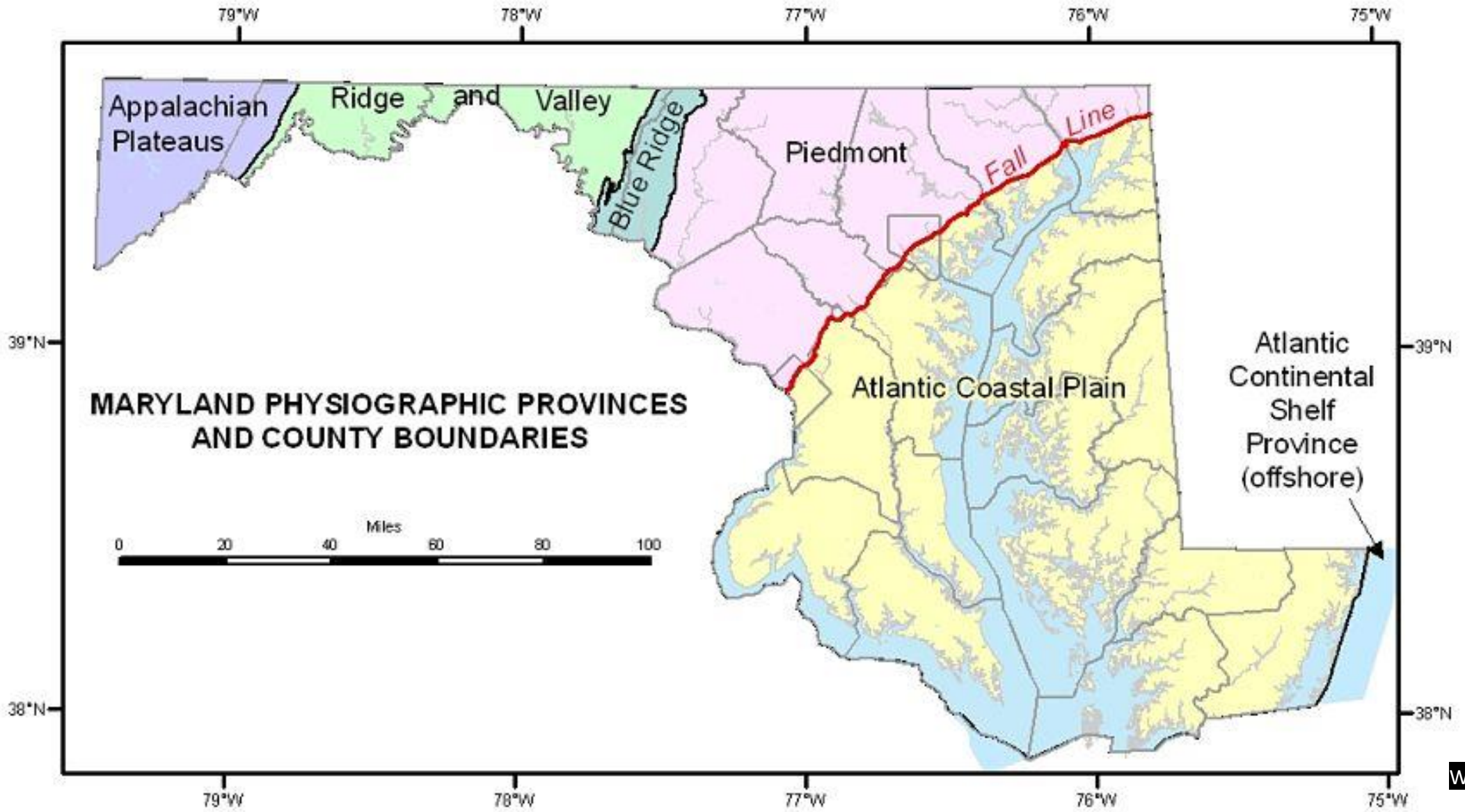



How would you describe the streams appearance?
What makes it look the way it does?
Does the appearance change over time?
How do the stream's physical characteristics influence the fish and insects that live in it?

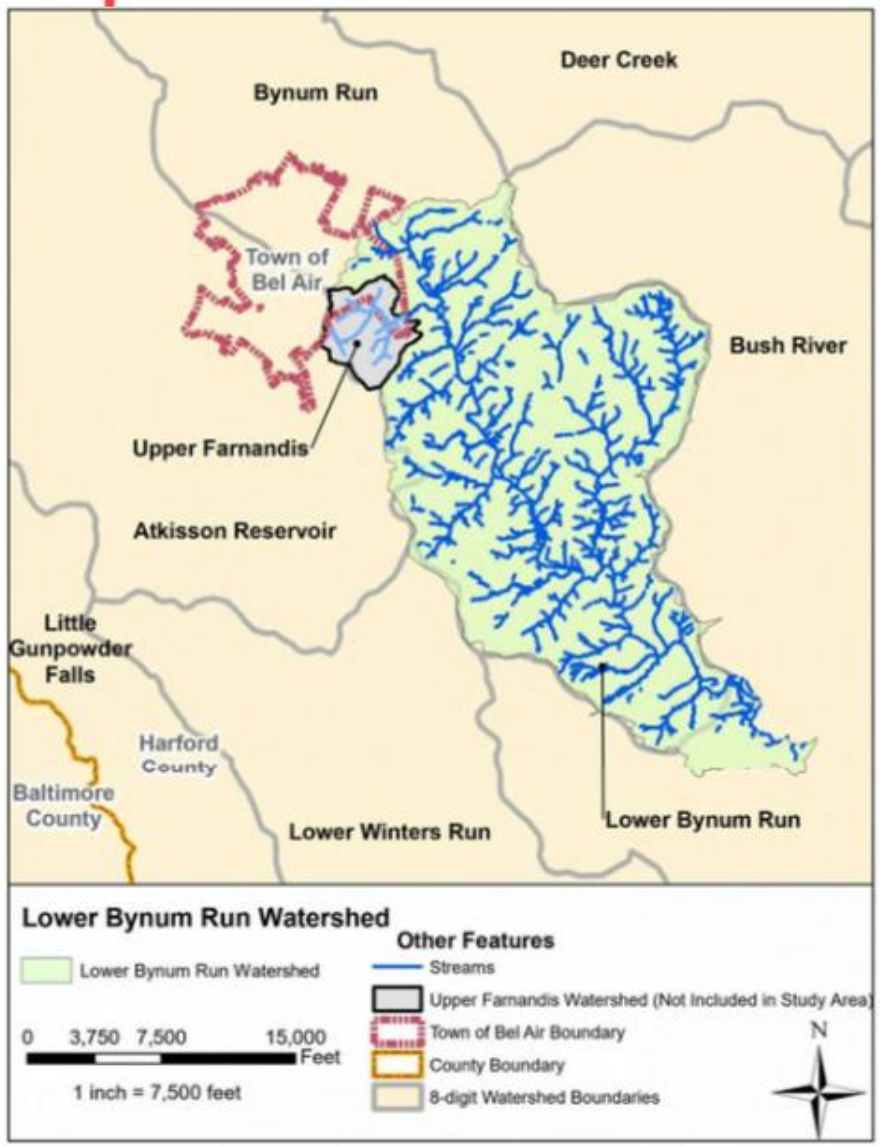
Watershed Factors Influencing Streams and Stream Flow

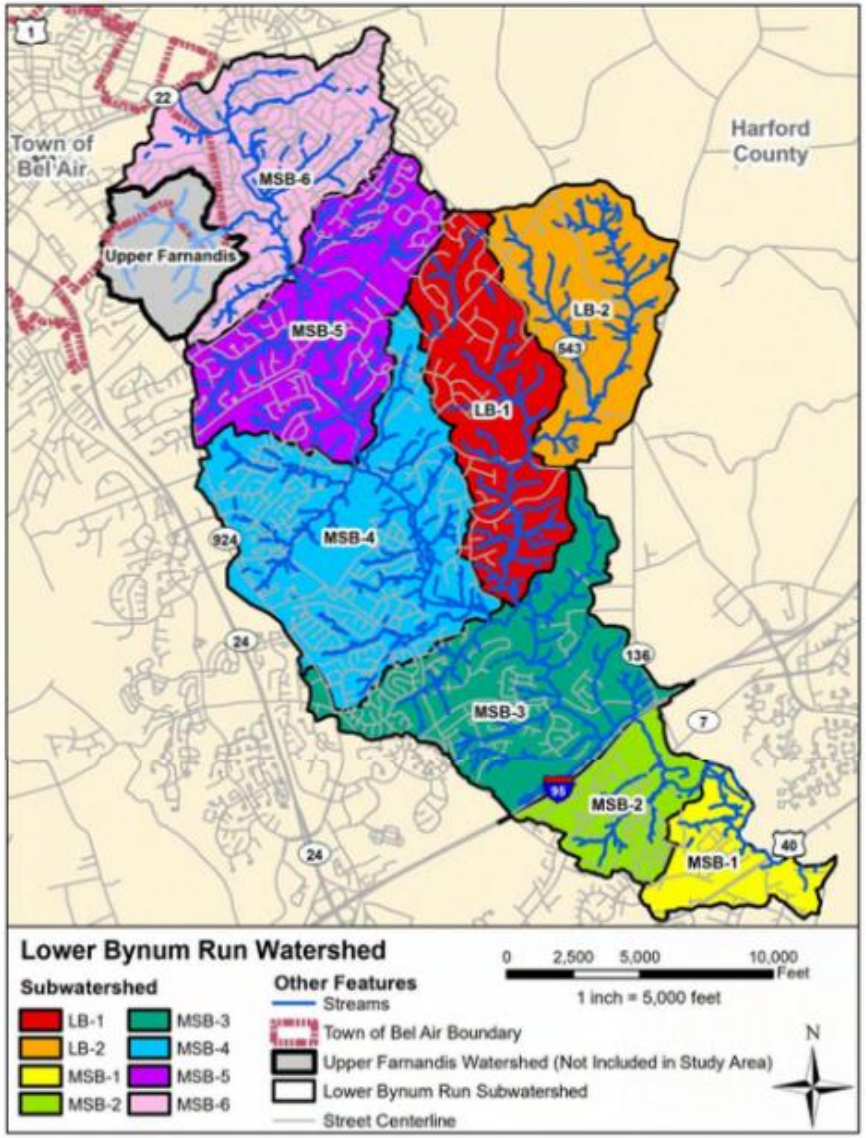
- Geology and Soils
- Shape
- Slope
- Land Use /Land Cover
- Impervious Surfaces





WSA 10.19.2021


Deer Creek
Bynum Run
Town of Bel Air
Bush River
Upper Farnandis
Atkisson Reservoir
Little Gunpowder Falls
Harford County
Baltimore County
Lower Winters Run
Lower Bynum Run
Lower Bynum Run Watershed
Lower Bynum Run Watershed
0 3,750 7,500 15,000 Feet
1 inch = 7,500 feet
Other Features
Streams
Upper Farnandis Watershed (Not Included in Study Area)
Town of Bel Air Boundary
County Boundary
8-digit Watershed Boundaries
N

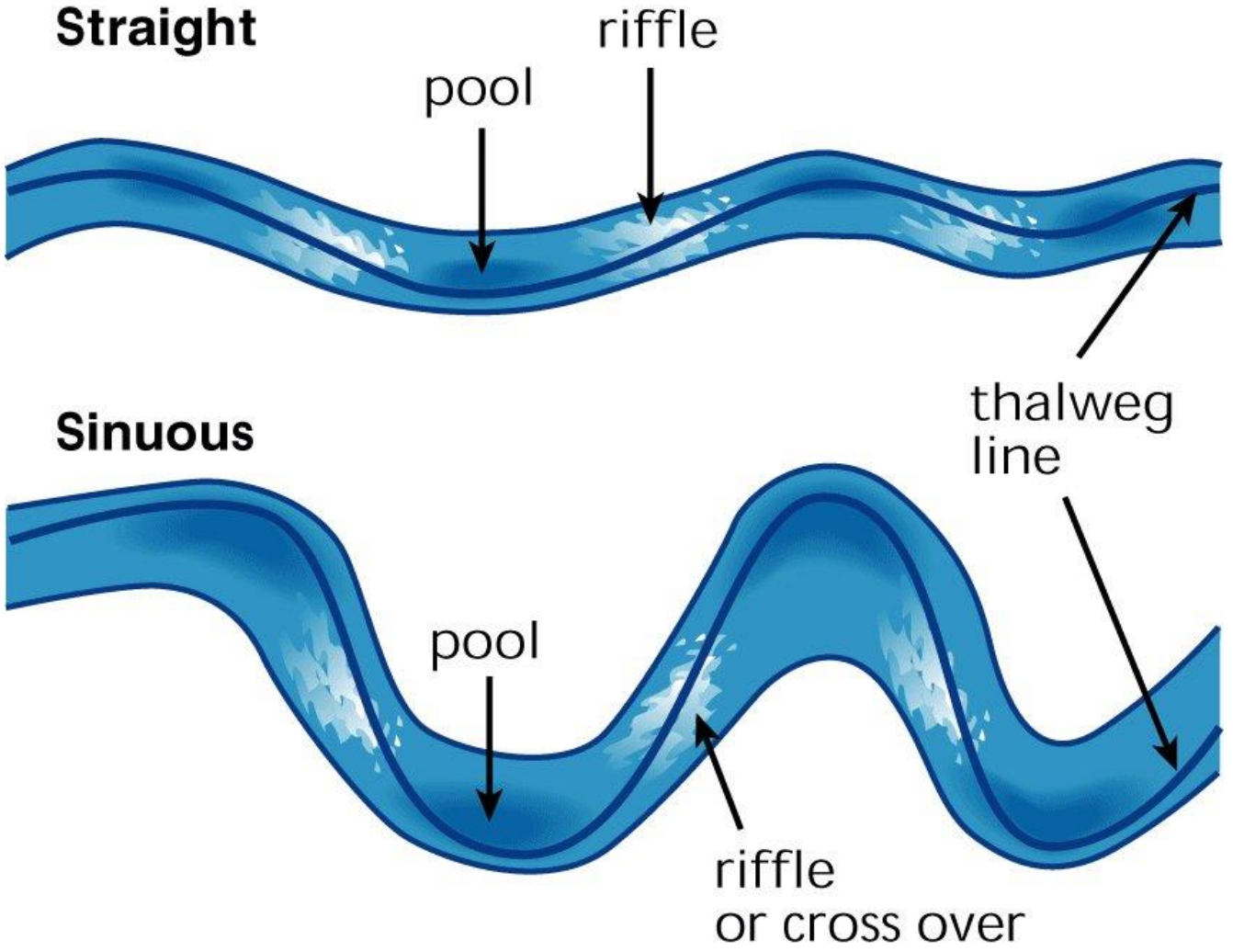

Town of Bel Air
Harford County
Upper Farnandis
MSB-6
MSB-5
LB-2
LB-1
MSB-4
MSB-3
MSB-2
MSB-1
Lower Bynum Run Watershed
Subwatershed
LB-1
LB-2
MSB-1
MSB-2
MSB-3
MSB-4
MSB-5
MSB-6
Other Features
Streams
Town of Bel Air Boundary
Upper Farnandis Watershed (Not Included in Study Area)
Lower Bynum Run Subwatershed
Street Centerline
0 2,500 5,000 10,000 Feet
1 inch = 5,000 feet
N

Stream Channel Perspectives

- Planform – the view taken looking down on the stream from above
- Cross Section – the view that results from a cut made perpendicular to the stream flow
- Longitudinal – view or profile taken if you could remove one side of the stream channel

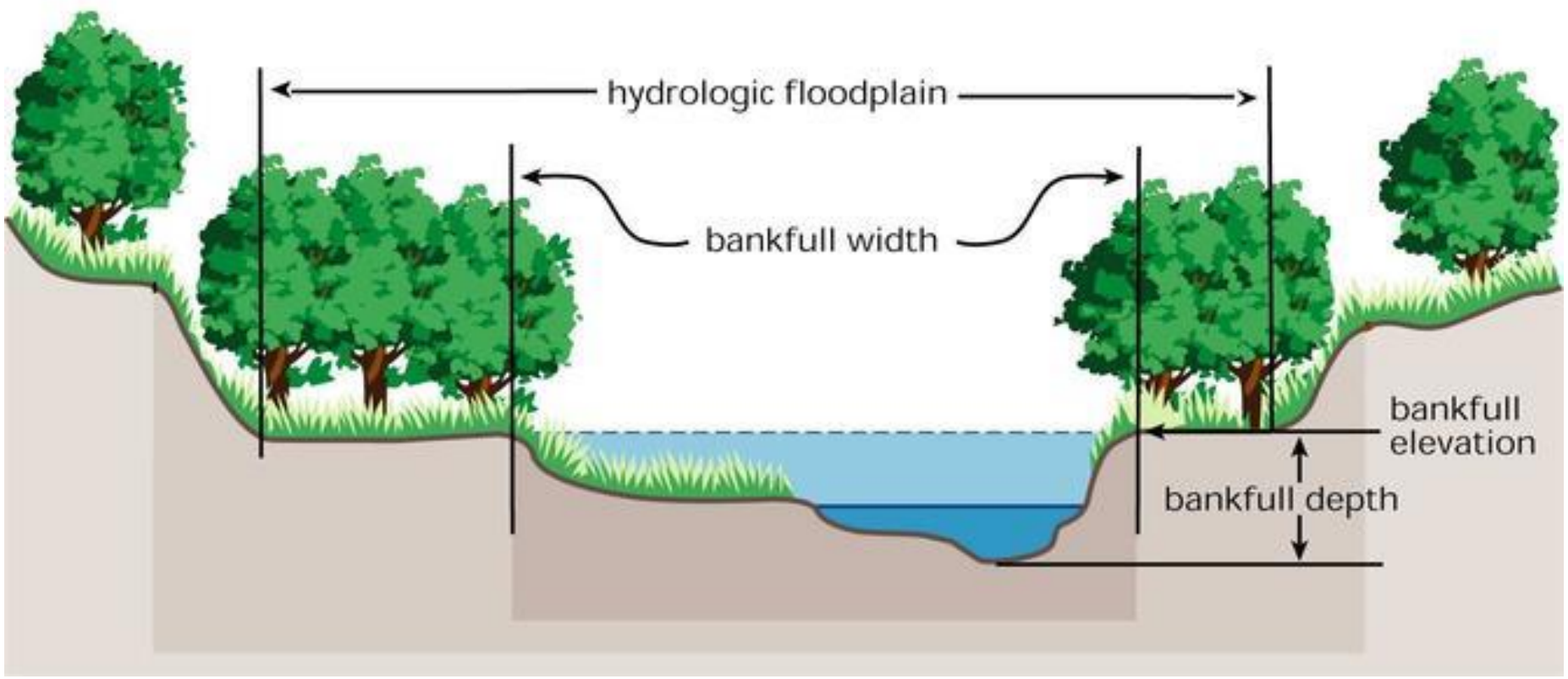
Planform

Relationship between the stream and the surrounding landscape
Shows the downstream path of the active channel



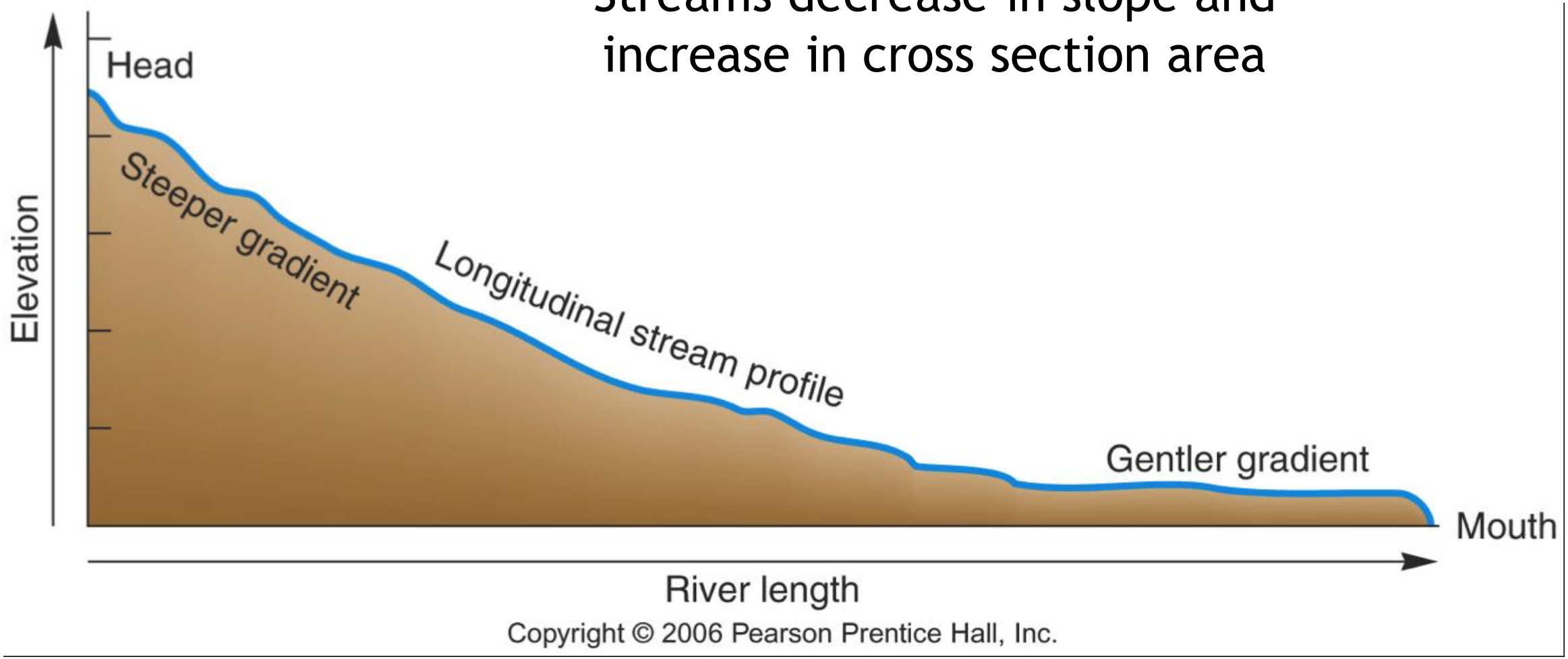
Cross Section

Provides measurements of channel width and depth;
channels ability to move water and sediment;
and determine aquatic habitat conditions



Longitudinal Profile

Streams decrease in slope and increase in cross section area

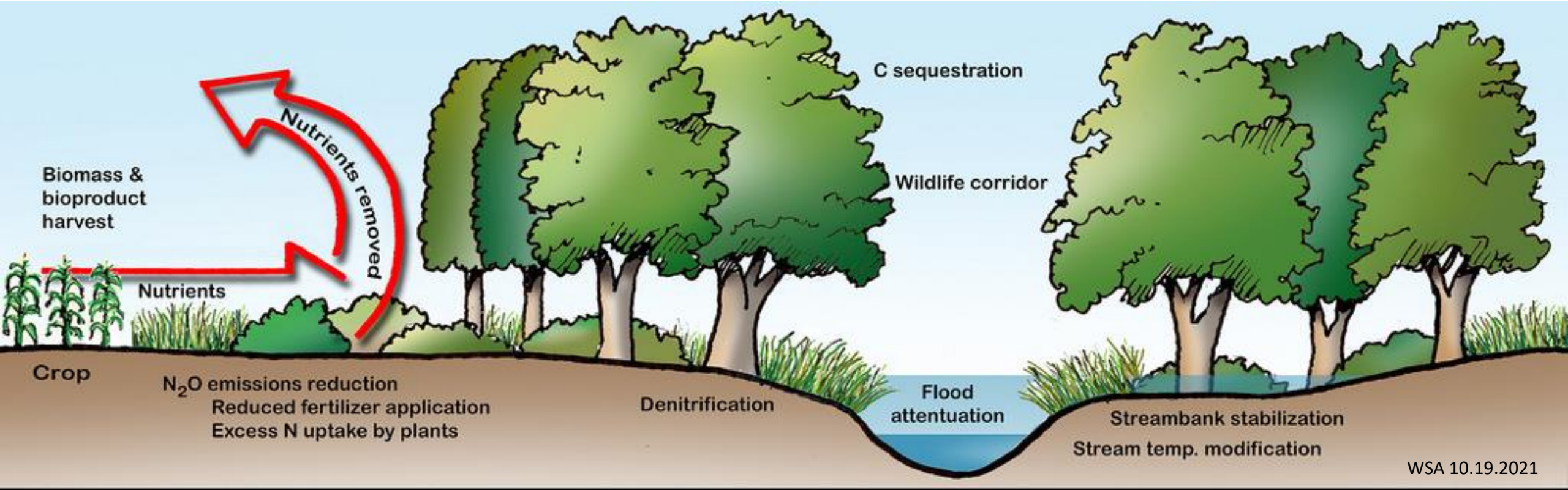


Stream Corridor Assessments

- Channel Alteration Sites
- Erosion Sites
- Exposed Pipes
- Fish Migration Barriers
- Inadequate Stream Buffers
- Pipe Outfalls
- Trash Dumping

Riparian Buffers

- Improve temperature, oxygen levels and reduce nutrient loadings to streams
- Stabilize streambanks, improve aquatic habitat, flood defense



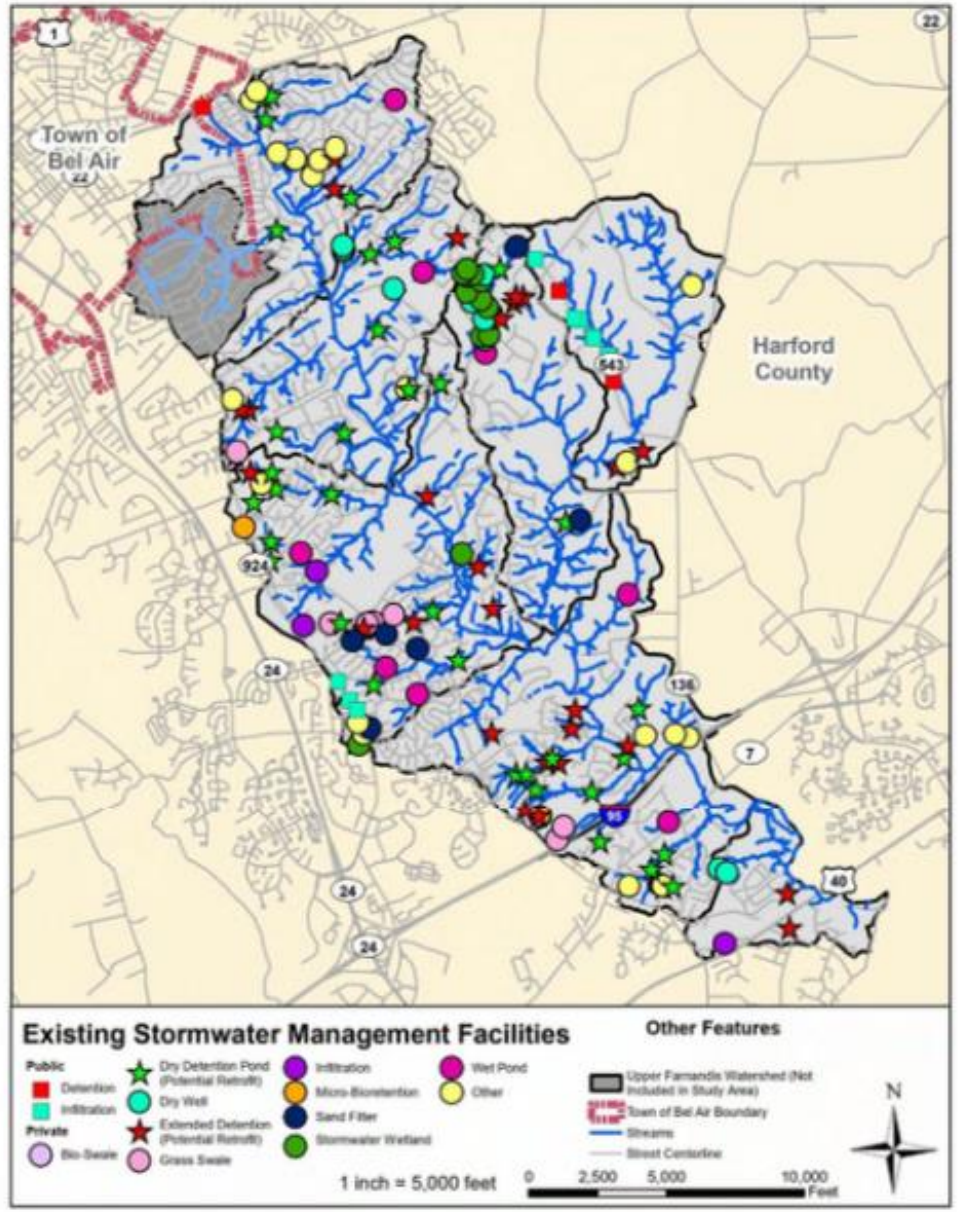


Figure 4-1. Distribution of Stormwater Management Facilities in Lower Bynum Run Watershed


Falling Branch Creek


Deer Creek


Deer Creek


Bynum Run


Broad Creek


Broad Creek


Unnamed Tributary to Winters Run


Unnamed Tributary to Winters Run

Unnamed Tributary to Winters Run


Farnandis Branch


Plumtree Run


Bynum Run


Bynum Run


Bear Cabin Branch


Bear Cabin Branch


Church Creek


Church Creek


Sam’s Branch


Fallston HS


Fallston Library

Table 1-1: List of Potential Restoration Projects in the Lower Bynum Run Watershed

PROJECT NAME	PROJECT DESCRIPTION
SWM0554	Wet Pond Retrofit
SWM000118	Submerged Gravel Wetland
SWM000257	Submerged Gravel Wetland
SWM000287	Submerged Gravel Wetland
SWM000312	Submerged Gravel Wetland
SWM000342	Submerged Gravel Wetland
SWM000347	Submerged Gravel Wetland
SWM000415	Submerged Gravel Wetland
SWM000428	Submerged Gravel Wetland
SWM000472	Submerged Gravel Wetland
SWM000622	Submerged Gravel Wetland
SWM000683	Submerged Gravel Wetland
SWM000685	Submerged Gravel Wetland
BMP-PR2-4	Bioretention
BMP-PR2-7	Bioretention
MSB-2A Stream Restoration	2,220 feet of stream restoration
MSB-2B Stream Restoration	1,160 feet of stream restoration
MSB-2C Outfall Stabilization	1 outfall stabilization
MSB-4A Stream Restoration	2,385 feet of stream restoration
MSB-4B Stream and Outfall Restoration	2,440 feet of stream restoration and 1 outfall stabilization
MSB-4C Stream Restoration	1,296 feet of stream restoration
MSB-4D Stream and Outfall Restoration	2,105 feet of stream restoration and 2 outfall stabilization
MSB-4E Stream and Outfall Restoration	3,325 feet of stream restoration and 1 outfall stabilization
MSB-4F Outfall Stabilization	1 outfall stabilization
MSB-4G Outfall Stabilization	1 outfall stabilization
MSB-5A Stream Restoration	2,058 feet of stream restoration
MSB-5B Stream Restoration	1,327 feet of stream restoration
MSB-5C Stream and Outfall Restoration	3,236 feet of stream restoration and 2 outfall stabilization
MSB-5D Stream and Outfall Restoration	3,354 feet of stream restoration and 3 outfall stabilization
MSB-5E Stream Restoration	743 feet of stream restoration
MSB-5F Outfall Stabilization	1 outfall stabilization
MSB-6A Stream Restoration	2,649 feet of stream restoration

BEFORE YOU DIG CALL
1-800-257-7777 OR DIAL 811

MISS UTILITY — CALL BEFORE YOU DIG

STILLMEADOW STREAM & OUTFALL RESTORATION

CONSTRUCTION DRAWINGS

BID NO. 20-166

HARFORD COUNTY, MARYLAND

GENERAL NOTES

1. TOPOGRAPHIC SURVEY WAS PERFORMED BY BAYLAND CONSULTANTS AND DESIGNERS, INC. IN MAY AND JUNE 2017. COORDINATES SHOWN HEREON ARE REFERRED TO MARYLAND COORDINATE SYSTEM (NAD 83/1991) AND ARE BASED ON RTK GPS VIRTUAL NETWORK. ELEVATIONS SHOWN HERE ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAD 88) AND ARE BASED ON RTK GPS VIRTUAL NETWORK.

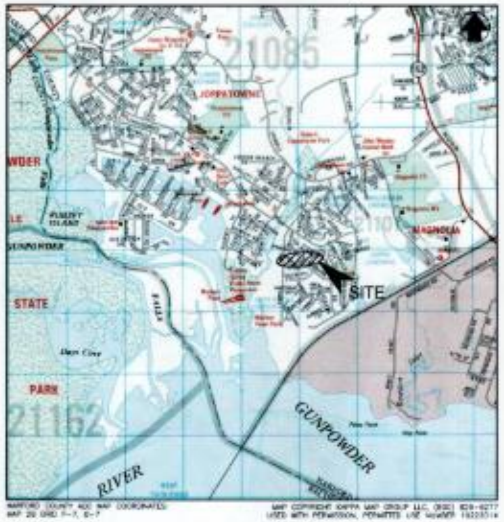
POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
TPS 3	633,076.16	1,497,490.06	8.62	REBAR/CAP
TPS 6	632,922.83	1,497,873.18	17.28	REBAR/CAP
TPS 11	632,843.71	1,498,479.68	33.87	REBAR/CAP

2. CONTOURS SHOWN OUTSIDE LIMIT OF WORK ARE BASED ON HARFORD COUNTY 2015 GIS TOPOGRAPHY.
3. EXISTING UTILITIES SHOWN OUTSIDE THE LIMIT OF WORK ARE BASED ON HARFORD COUNTY GIS & HAVE NOT BEEN FIELD LOCATED.
4. PROPERTY LINES AND EASEMENTS SHOWN ARE BASED ON HARFORD COUNTY 2017 CADASTRAL DATA.
5. ONLY TREES WITH A 12" DIAMETER OR GREATER WITHIN THE LIMITS OF WORK WERE FIELD LOCATED.
6. WETLAND DELINEATION WAS PERFORMED BY BAYLAND CONSULTANTS AND DESIGNERS, INC IN JUNE 2017.
7. THE STREAM IS AN UNNAMED TRIBUTARY TO FOSTER BRANCH (GUNPOWDER WATERSHED MD BASIN CODE: 02130801) AND IS A USE I STREAM WITH A STREAM CLOSURE PERIOD OF MARCH 1ST TO JUNE 15TH.
8. FEMA FIRMS FM24025C0263E AND FM24025C0264E EFFECTIVE APRIL 19, 2016 SHOWS THAT NO PROPOSED WORK IS WITHIN THE 100-YEAR FLOODPLAIN.
9. THE PROJECT IS LOCATED WITHIN THE CRITICAL AREA.

GENERAL CONSTRUCTION NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE HARFORD COUNTY STANDARD SPECIFICATIONS OR DETAILS FOR CONSTRUCTION UNLESS OTHERWISE NOTED. THE STATE HIGHWAY ADMINISTRATION'S HIGHWAY'S STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS AND THE BOOK OF STANDARDS FOR HIGHWAY & INCIDENTAL STRUCTURES SHALL BE USED IF NO HARFORD COUNTY STANDARD OR DETAIL EXIST.
2. THE EXISTING UTILITIES AND OBSTRUCTIONS SHOWN ARE FROM THE BEST AVAILABLE RECORDS AND SHALL BE VERIFIED BY THE CONTRACTOR TO THEIR SATISFACTION PRIOR TO CONSTRUCTION. NECESSARY PRECAUTIONS SHALL BE TAKEN BY THE CONTRACTOR TO PROTECT EXISTING SERVICES AND MAINS AND ANY DAMAGE TO THEM SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S OWN EXPENSE.
3. THE CONTRACTOR SHALL CONTACT "MISS UTILITY" AT 1-800-257-7777 A MINIMUM OF 48 HOURS IN ADVANCE OF ANY EXCAVATION, BORING, PILE DRIVING AND/OR DIGGING FOR THE LOCATION OF GAS, ELECTRIC, TELEPHONE, WATER AND SEWER LINES.
4. MECHANICAL EXCAVATION SHALL NOT BE CONDUCTED WITHIN 2 FEET HORIZONTALLY OR WITHIN 2 FEET VERTICALLY OF KNOWN UTILITY LOCATIONS. HAND OR SOFT DIGGING SHALL BE DONE WITHIN THESE LIMITS. UNDERGROUND UTILITIES, ONCE UNCOVERED, SHALL BE PROTECTED FROM BEING STRUCK BY EQUIPMENT.
5. IT SHALL BE DISTINCTLY UNDERSTOOD THAT FAILURE TO MENTION SPECIFICALLY ANY WORK WHICH WOULD NATURALLY BE REQUIRED TO COMPLETE THE PROJECT SHALL NOT RELIEVE THE CONTRACTOR OF THEIR RESPONSIBILITY TO COMPLETE SUCH WORK.
6. ALL TREES WITH A DIAMETER GREATER THAN 12 INCHES WITHIN THE LIMIT OF DISTURBANCE SHALL NOT BE REMOVED UNLESS FROM APPROVAL IS OBTAINED OR EXPLICITLY SHOWN ON THE PLANS TO BE REMOVED. ALL TREES TO REMAIN WITHIN THE LIMIT OF DISTURBANCE THAT ARE NOT TO BE REMOVED SHALL BE PROTECTED.
7. ALL FILL AREAS SHALL BE CLEARED OF ALL VEGETATION AND DEBRIS, SCARIFIED TO A MINIMUM DEPTH OF 12 INCHES PRIOR TO THE PLACEMENT OF FILL. FILL MATERIAL SHALL BE PLACED IN CONTROLLED LIFTS WITH A MAXIMUM THICKNESS OF 8" PRIOR TO COMPACTION THAT IS CONTINUOUS OVER THE ENTIRE AREA OF FILL. EACH LAYER OF FILL SHALL BE COMPACTED WITH THE MINIMUM NUMBER OF PASSES NECESSARY TO PRODUCE A FULL ASPHALTIC COMPACTION.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MATERIALS TESTING INCLUDING CONCRETE, FLOWABLE FILL, HOT MIX ASPHALT AND FILL COMPACTION. ALL MATERIALS TESTING SHALL BE PERFORMED BY THE CONTRACTOR AND SHALL BE COMPENSATED FOR AS PART OF THE APPROPRIATE PAY ITEM.
9. SEE STANDARD GEOTECHNICAL NOTES FOR FILL COMPACTION TESTING REQUIREMENTS.
10. ALL DISTURBED AREAS SHALL HAVE PERMANENT OR TEMPORARY STABILIZATION COMPLETED WITHIN:
    - 10.A. END OF THE WORK DAY FOR AREAS WITHIN WATERWAYS.
    - 10.B. THREE CALENDAR DAYS ON SLOPES GREATER THAN 3:1 AND TO THE SURFACE OF ALL PERIMETER SEDIMENT CONTROLS.
    - 10.C. SEVEN CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS.
    - 10.D. ALL STABILIZATION MUST BE IN ACCORDANCE WITH MARYLAND DEPARTMENT OF AGRICULTURE (MDA) FERTILIZER LAW.
11. ALL DISTURBED AREAS WITH SLOPES GREATER THAN 3:1 SHALL BE STABILIZED WITH 100% BIODEGRADABLE SOIL STABILIZATION MATTING THAT HAS A SUFFICIENT DESIGN SHEAR STRESS FOR THE APPLICATION OR AS SHOWN ON THE APPROVED SEDIMENT AND EROSION CONTROL PLANS.
12. ALL PERMANENTLY STABILIZED AREAS SHALL INCLUDE A MINIMUM OF 4" OF TOPSOIL PER THE 2011 MDE SPECIFICATIONS.
13. ALL STAKING, RESTAKING, AND CUT SHEETS SHALL BE PERFORMED BY A REGISTERED LAND SURVEYOR OR PROFESSIONAL ENGINEER AT THE CONTRACTOR'S EXPENSE.
14. ALL CONSTRUCTION TO BE PERFORMED IN ACCORDANCE WITH STATE OF MARYLAND OCCUPATIONAL SAFETY LAWS.
15. CONTRACTOR MUST ENSURE THAT COPIES OF FEDERAL, STATE, AND LOCAL PERMITS ARE POSTED ON SITE PRIOR TO THE START OF ANY WORK.
16. ALL ROADS SHALL BE CLEANED AND CLEARED BY THE END OF EACH DAY. ANY MUD OR ROCKS TRACKED ON THE ROADWAYS SHALL BE SWEPT BEFORE THE END OF SHIFT EACH DAY.
17. CONTRACTOR SHALL RESTORE ALL AREAS IMPACTED BY CONSTRUCTION ACTIVITY. THIS SHALL INCLUDE BUT IS NOT LIMITED TO GRASS AREAS, ROADS, PAVED AREAS, ETC.

SHEET LIST



LOCATION MAP

SCALE: 1"=2000'

DEVELOPER

HARFORD COUNTY DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS AND STORMWATER MANAGEMENT
212 SOUTH BOND STREET, 3RD FLOOR
BEL AIR, MARYLAND 21014

OWNERS

FOSTER BRANCH HOMEOWNERS ASSOCIATION, INC.

ENGINEER

BAYLAND CONSULTANTS & DESIGNERS, INC.

LEGEND

FIELD VERIFICATION CERTIFICATION

CHRISTOPHER STEIN — 7/10/19

OWNER'S/DEVELOPER'S CERTIFICATION

JOSEPH J. SIEWICK, P.E. · DIRECTOR OF PUBLIC WORKS — 9.30.19

ENGINEER'S CERTIFICATION

CHRISTOPHER STEIN — 7/10/19 — 21146

AS-BUILT CERTIFICATION

PROFESSIONAL CERTIFICATION

EROSION AND SEDIMENT CONTROL PLAN #: 59838

RECOMMENDED FOR APPROVAL — 10-11-19 — HARFORD COUNTY/DPW

TECHNICAL CONCURRENCE — 10-16-19 — HARFORD SOIL CONSERVATION DISTRICT

APPROVED — 10/18/19 — HARFORD SOIL CONSERVATION DISTRICT

SWM APPROVAL

HARFORD COUNTY BILLING NUMBER 97032

10/2/19 — WATER RESOURCES ENGINEERING

10/2/19 — CHIEF ENGINEER

10/02/19 — DEPUTY DIRECTOR OF PUBLIC WORKS

10.3.19 — DIRECTOR OF PUBLIC WORKS

CAPITAL PROJECT APPROVAL

9/25/19 — PROJECT ENGINEER

09/25/19 — CHIEF ENGINEER

09/25/19 — DEPUTY DIRECTOR OF PUBLIC WORKS

9.30.19 — DIRECTOR OF PUBLIC WORKS

191486
S/C PLAN # 59838 | GRA # 15387-2018

191411
EG-SWMENG- 000372-2018 | # 97032

191590

CLEAR CREEKS CONSULTING

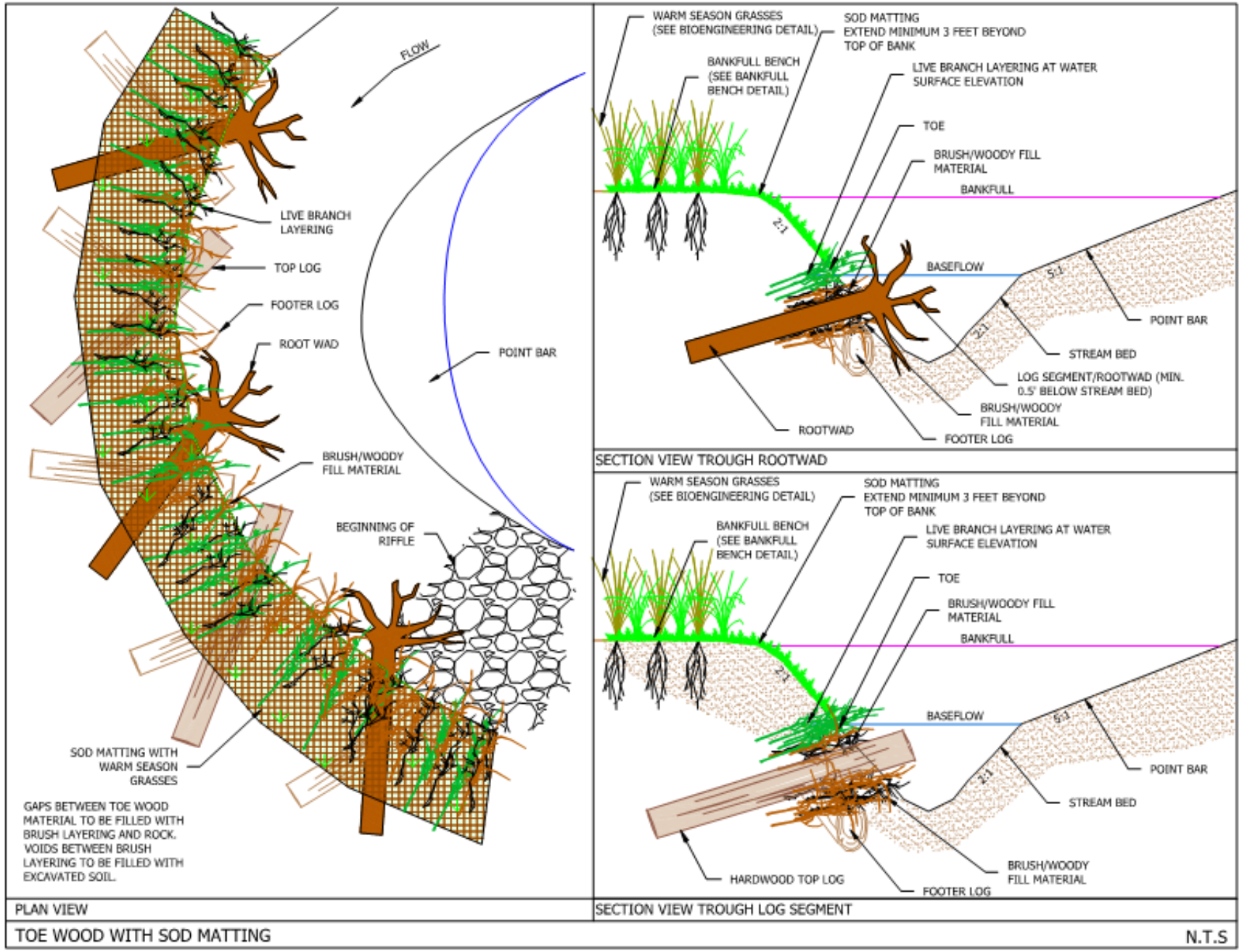
Bayland Consultants & Designers, Inc.
"Integrating Engineering and Environment"
7455 New Ridge Road, Suite T
Hanover, Maryland 21076

7/10/19

HARFORD COUNTY, MARYLAND

STILLMEADOW STREAM & OUTFALL RESTORATION
COVER SHEET

SCALE: AS SHOWN
SHEET 1 OF 35

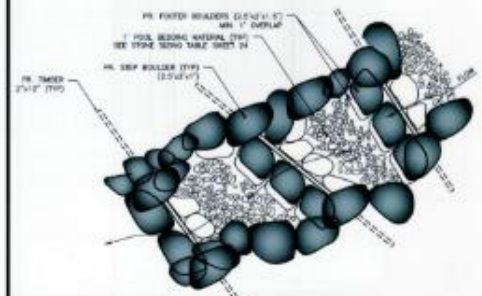


TOE WOOD WITH SOD MATTING

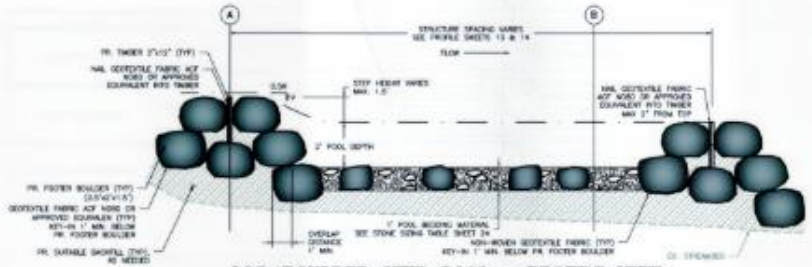
N.T.S


Wheel Creek

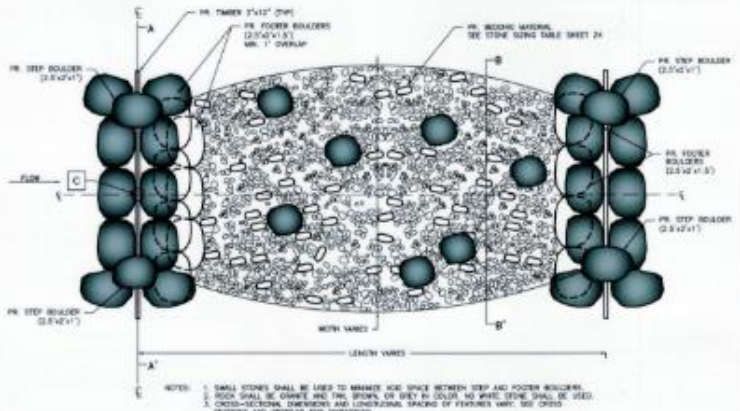

KOMATSU EX5



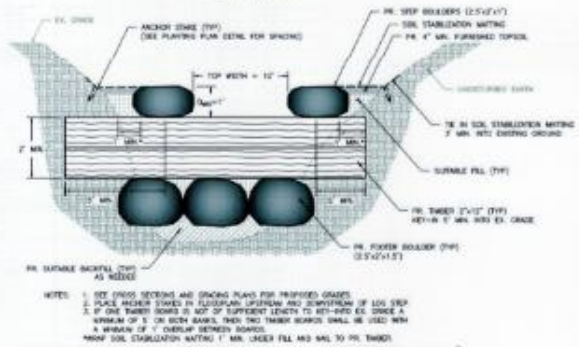
LOG-BOULDER STEP POOL - ISOMETRIC VIEW
SCALE: NOT TO SCALE



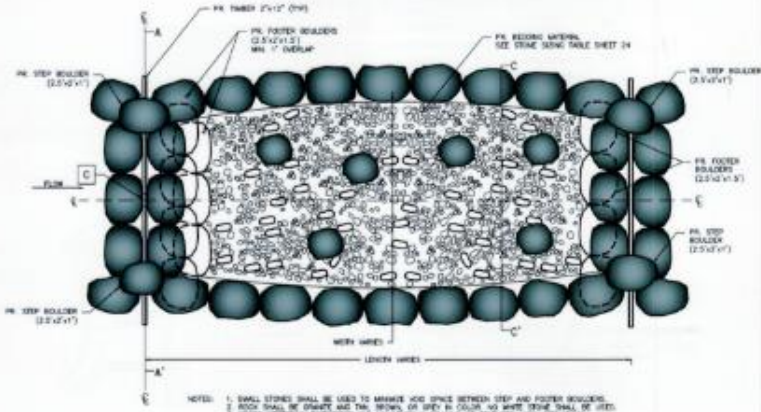
LOG-BOULDER STEP POOL - PROFILE VIEW
SCALE: NOT TO SCALE



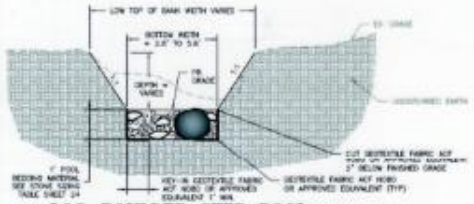
LOG-BOULDER STEP POOL - PLAN VIEW
SCALE: NOT TO SCALE



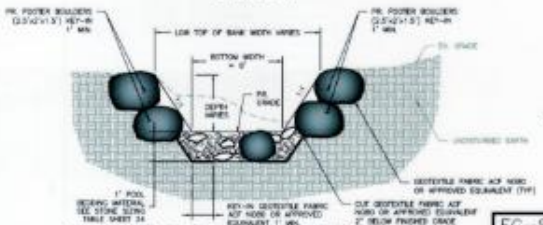
LOG-BOULDER STEP POOL - SECTION A-A'
SCALE: NOT TO SCALE



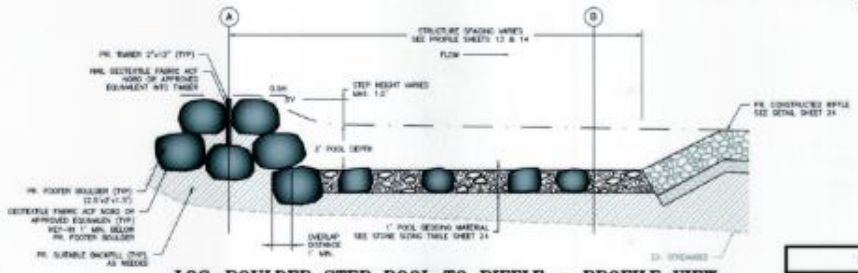
ARMORED LOG-BOULDER STEP POOL - PLAN VIEW (NEAR BLACKBURN COURT ONLY)
SCALE: NOT TO SCALE



LOG-BOULDER STEP POOL - SECTION VIEW B-B'
SCALE: NOT TO SCALE



ARMORED LOG-BOULDER STEP POOL - SECTION VIEW C-C' (NEAR BLACKBURN COURT ONLY)
SCALE: NOT TO SCALE



LOG-BOULDER STEP POOL TO RIFFLE - PROFILE VIEW
SCALE: NOT TO SCALE

EG-SWMENG- 000372-2018 | # 97032

CLEAR CREEKS CONSULTING

Bayland Consultants & Designers, Inc.
"Integrating Engineering and Environment"
7455 New Ridge Road, Suite F
Hanover, Maryland 21076
Phone: (410) 694-0431
Fax: (410) 694-0185
www.baylandinc.com

REVISIONS

HARFORD COUNTY, MARYLAND

STILLMEADOW STREAM & OUTFALL RESTORATION
STREAM DETAILS & NOTES

DRAWN BY: JP/DH
DESIGNED BY: JP
REVIEWED BY: MRD
CONTRACT NO: 18-133
SCALE: AS SHOWN
SHEET: 23 OF 35
DATE: 07/25/19

191612

Wheel Creek

Wheel Creek


210
Wheel Creek

Stream Vocabulary

Physiographic Province
Planform
Cross Section
Longitudinal Profile
Stream Order
Pool
Riffle
Run
Riparian Buffer
Stream Stabilization